

Red Spruce-Fraser Fir Forest is a rare type that occurs at very high elevations on slopes and crests, typically above Northern Hardwood Forest communities. It differs from Fraser Fir Forest in having a canopy dominated by red spruce (*Picea rubens*) and sometimes Fraser fir (*Abies fraseri*), with occasional northern hardwood trees. Understories are usually sparse, but may be moderately dense, with shrubs such as mountain highbush blueberry (*Vaccinium simulatum*), Blue Ridge blueberry (*Vaccinium altomontanum*), mountain cranberry (*Vaccinium erythrocarpum*), witch-hobble (*Viburnum lantanoides*), and mountain elderberry (*Sambucus pubens*). Herbs and mosses are typically a dense collection of high-elevation species.

Rich Cove Forest is a widespread type that occupies low to middle elevations in moist, sheltered coves and slopes on deep soils. They have a closed canopy which often includes yellow buckeye (*Aesculus flava*), basswood (*Tilia heterophylla* var. *americana*), yellow poplar (*Liriodendron tulipifera*), sweet birch (*Betula lenta*), cucumbertree (*Magnolia acuminata*), and black cherry (*Prunus serotina*), among others. Unusual examples on mafic rock types support abundant sugar maple (*Acer saccharum*) and white ash (*Fraxinus americana*), with occasional shagbark hickory (*Carya ovata*). The understory and shrub layers are fairly open, but herbs are dense and diverse. The vine Dutchman's-pipe (*Aristolochia macrophylla*) often forms tangles in trees. Typical herbs include plants of cultural and medicinal value such as ginseng (*Panaxquinquefolius*), ramps (*Allium tricoccum*), goldenseal (*Hydrastis canadensis*), and black cohosh (*Cimicifuga* spp.), as well as blue cohosh (*Caulophyllum thalictroides*), dutchman's-breeches (*Dicentra cucullaria*), squirrel-corn (*Dicentra canadensis*), Canada richweed (*Collinsonia canadensis*), wild geranium (*Geranium maculatum*), wild ginger (*Asarum canadense*), foamflower (*Tiarella cordifolia*), yellow mandarin (*Prosartes lanuginosa*), bloodroot (*Sanguinaria canadensis*), sweet cicely (*Osmorhiza claytonii*), violets (*Viola* spp.), goat's-beard (*Aruncus dioicus*), false goat's-beard (*Astilbe biternata*), fancy fern (*Dryopteris intermedia*), marginal wood-fern (*Dryopteris marginalis*), southern lady fern (*Athyrium asplenoides*), silvery spleenwort (*Deparia acrostichoides*), maidenhair fern (*Adiantum pedatum*), wood-nettle (*Laportea canadensis*), and potentially many dozens of others. Many rare species of nutrient-rich forests can occur in these communities.

Southern Appalachian Bog (Northern Subtype) communities are very rare and restricted to montane North Carolina, Tennessee, and southwest Virginia. They are naturally rare, due to location on flat montane bottomlands which are typically small. Their rarity is also largely due to the susceptibility of such locations to alterations such as draining, filling, or conversion to pasture. They differ from other montane wetlands in having species that are largely restricted to bogs, many of which are rare northern disjuncts or Southern Appalachian endemics. Southern Appalachian Bogs are naturally open, and usually have a diverse mixture of vegetation including zones dominated by wetland shrubs, herbs, and sphagnum mosses (*Sphagnum* spp.). Typical herbs include cinnamon fern (*Osmunda cinnamomea*), marsh fern (*Thelypteris palustris*), roughleaf goldenrod (*Solidago patula*), orange jewelweed (*Impatiens capensis*), sedges (*Carex* spp.), rushes (*Juncus* spp.), and bulrushes (*Scirpus* spp.). Uncommon or rare species may include cranberry (*Vaccinium macrocarpon*), tawny cottongrass (*Eriophorum virginicum*), Canada burnet (*Sanguisorba canadensis*), narrowleaf willowherb (*Epilobium leptophyllum*), Gray's lily (*Lilium grayi*), culver's-root (*Veronicastrum virginicum*), crested woodfern